point there is a deeper kinship between an experiment on the discrimination of space-intervals and one on the discrimination of time-intervals than there is between the latter and experiments in simple reaction-time. And yet in the author's arrangement the mere difference in the object separates the various experiments on discrimination by nearly the thickness of the book, while the time elements bring reaction experiments close to those on the estimate of time-intervals, although the mental processes investigated in these experiments are as different as can be.

But it is when interpreting experimental results that the author shows to least advantage. If one were to generalize on the character of the new movement in psychology from such writings as this, one might say that the 'New Psychology' is wofully lacking in psychological insight. There is tireless nicety in gathering 'facts,' only to make slovenly generalizations which these facts do not warrant. Emerson could have pointed to this as another illustration of his wide law of compensation. If the older psychology was deficient on the side of exact experiment, the new seems too often wanting in any clear notion of what the experiments prove.

Many illustrations of this could be gathered from the book, but the single instance of tap-time must suffice. The rapidity with which taps can be given on an electric key is assumed by the author to indicate the rate at which we can make separate acts of will. In truly scientific work, however, it would seem appropriate that the same exactness which is displayed in recording and counting the taps should also be used in determining whether these separate movements of the finger are really due to separate acts of will. To the present writer, at least, the maximum rate of tapping seems to be obtained by a peculiar muscular tension which is preserved (it is true) by an act of will, but the separate oscillations of the finger are no more indicative of distinct acts of will than a sustained rigidity would imply a separate volition for each unit of time the contraction was maintained. Let us, by all means, have the spark-method and full tables of mean variation and all else that scientific accuracy may require, but let us not neglect the weightier matters of the law.

But, in spite of these and other defects, the volume gives a really valuable account of the more mechanical side of the experimental work, and contains in small compass much that had never been gathered into any single book. So that Dr. Scripture has done good service in collecting and arranging all this material. It is to be regretted that the author's unfortunate manner will, in too many cases, prevent even his account of laboratory contrivances, in which he is at his best, from getting the hearty recognition which the reader would otherwise be sure to give.

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Traité élémentaire de mécanique chimique, fondée sur la Thermodynamique. By P. Duhem. Paris, A. Hermann. 1898. Vol. II. Large 8vo. Pp. 378. Price, paper, 12 fr.

In treating the subject of chemical equilibrium one can classify the matter according to components and subdivide according to variance, or one can reverse this, classifying according to variance and subdividing according to components. The first method is well adapted to books on qualitative equilibrium, in which the object is to get a clear view of the behavior of a system as a whole. In books on quantitative equilibrium it seems more rational to group like equations together, and for that reason it is better to discuss all nonvariant systems and then all monovariant systems. Since this second method has not yet been adopted by any one, it is perhaps not surprising to find that Duhem has chosen the other in preference. The present volume, the second of the series, treats of the laws describing one-component systems and the systems which can be made from these by addition or subtraction of heat or work. This last statement may not be clear without some explanatory comment. If we start with solid ammonium chlorid we certainly have a one-component system, and this is not altered by the fact that the vapor given off by this substance is composed chiefly of ammonia and hydrochloric acid. If we are not to make any distinction between a substance which dissociates in the vapor phase and one

which does not, there is no question but that we should take up next the case of a substance which dissociates into a vapor and a liquid or a vapor and a solid. An instance of this last is calcium carbonate, which dissociates on heating, forming carbonic acid and calcium oxide. This is a two-component system, but it has been derived from a one-component system by heating, and is therefore discussed by Duhem. This is a very ingenious way of attacking the subject, and has the great merit that the transition from one to two components is made gradually and not abruptly. It has the disadvantage that one has to cover this intermediate ground a second time when studying two-component systems. What Duhem has done is to consider, in this volume, systems such that the sum total of all the masses in all the phases can be represented by the chemical formula for a compound.

The book is divided into three parts, the first of which includes saturated vapors, the phenomena of boiling, change of freezing point and equilibrium between solid and solid, dissociation curve for two solids and vapor, the triple point and the curves meeting in it. The second part of the volume deals with the continuity between the liquid and the gaseous states, while dissociation in the vapor phase is taken up in the closing section. Of special interest are the chapters on the phenomena of boiling, on apparent false equilibrium as applied to boundary curves, on dissociation in gases and on the theory of false equilibrium. The book attempts, in an admirable manner, to present exact theory in such a form as to be applicable to experimental data and not to hypothetical or simplified phenomena. Of course, this is a goal which no treatise can hope to attain at the present time; but this volume of Duhem's comes nearer to it than anything that has yet been published. It is not too much to predict that the whole study of organic chemistry will be revolutionized as soon as the points of view suggested by Duhem become well understood. All the phenomena connected with isomerism become capable of quantitative treatment as soon as they are studied experimentally with reference to the theory of false equilibrium and the theory of permanent changes recently developed by Duhem. It seems probable that it will be possible, by application of these same two theories, to make an intelligent study of all chemical reactions not involving more than four components.

WILDER D. BANCROFT.

SOCIETIES AND ACADEMIES.

THE PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 478th meeting of the Society was held at the Cosmos Club at 8 p. m., on January 22d. Two papers were presented: The first by Dr. Walter Hough on the 'Origin and Range of the Eskimo Lamps.' The conclusions reached were: That the Eskimo before he migrated from his pristine home had the lamp, this utensil being a prerequisite to migration into high latitudes. That one of the most important functions of the lamp is for melting snow and ice for drinking water. That the lamp is employed for lighting, warming, cooking, melting snow, drying clothes and in the arts, thus combining in itself several functions which have been differentiated among civilized peoples. That the architecture of the house is related to the use of the lamp. The house is made non-conducting and low in order to utilize the heated air. That the lamp is a social factor, peculiarly the sign of the family unit, each head of the family (the woman) having her lamp. That the invention of the lamp took place on some seacoast, where fat of aquatic mammals of high fuel value was abundant, rather than in the interior, where the fat of land animals is of low fuel value. That the typical form of the lamps arises from an attempt to devise a vessel with a straight wick edge combined with a reservoir giving the vessel an obovate or ellipsoidal shape.

Finally, from observation of lamps from numerous localities around the Eskimo shoreline, it is concluded that lamps in low latitudes below the circle of illumination are less specialized than those of higher latitudes. For instance, the lamps of southern Alaska have a wick edge of two inches, while those of Point Barrow and northern Greenland have a wick edge of from 17 to 36 inches in width. It becomes possible, then, to say with some certainty the degree of north latitude to which a lamp appertains, light and temperature being